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AIR FORCE METROLOGY AND

CALIBRATION PROGRAM

Ogden Air Logistics Center – OO/ALC
Hill AFB, Utah
Organic Precision Measurement Equipment Laboratory

Chg 1

QM TABLE OF CONTENTS

Table 1

CHANGES AND REVIEWS

The Quality Manual and associated documents are reviewed at least annually (CY) by the PMEL Manager, Quality Manager, and personnel designated by management to ensure the document is current, valid, and effective. Significant changes or revisions should also be documented.

DATE	ACTION	LEL PMEL Manager	LEQL Branch Chief	LELA Branch Chief	LELB Branch Chief	LELC Branch Chief	LELD Branch Chief	LELG Branch Chief	LELJ Branch Chief
2002/01/03	**Initial Review**								
2002/04/10	**Chg. 1**								

OO/ALC PMEL QUALITY MANUAL
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Section 1

MANAGEMENT POLICY STATEMENT

1.1. OPENING STATEMENT: Published directives tell us that traceability of measurements is established through the integration of the calibration procedure, a stable environment, a facility that supports this type of measurement, and an unbroken chain of comparisons ending in a laboratory at the base reference standard.

This manual will be used as a tool to ensure Ogden maintains reliability and accuracy while providing standardized measurements that are traceable to NIST or other nationally recognized standards and are reliable and accurate.

The intention of creating and using a quality manual is to create the ability to consistently manage the following areas to accomplish the goals described above. First, provide a facility capable of maintaining a consistent environment where TMDE is calibrated. Second, maintain a highly skilled workforce that understands the metrology world and are motivated to assure traceability and accuracy. Third, provide the appropriate equipment and materials necessary to ensure that accuracy and reliability can be obtained. Fourth, provide the necessary written orders and directives so technicians have the direction they need to perform calibrations with consistency.

OO-ALC Hill Air Force Base Organic Precision Measurement Equipment Laboratory (PMEL) is a world-class organization with a single goal of providing quality products to our customers within a reasonable amount of time.

1.2. OBJECTIVE: This laboratory will ensure measurement traceability, provide quality services, and maintain AFMETCAL certification in support of the AFMETCAL and the Hill Air Force Base PMEL mission:

AFMETCAL MISSION STATEMENT

To develop and sustain precision measurement capabilities to ensure traceable, accurate, reliable, and safe air and space systems performance.

OO/ALC PMEL MISSION STATEMENT

OO/ALC PMEL will strive to provide exceptional service and world wide system support to our customers while maintaining accurate and precise measurement capabilities traceable to the National Institute of Standards and Technology.

1.3. TRACEABILITY: All measurements will be performed under controlled conditions using standards, procedures, and practices prescribed in T.O. 00-20-14 to ensure measurement traceability through the Air Force Primary Standards Laboratory (AFPSL) to the National Institute of Standards and Technology (NIST) or other AFMETCAL approved sources.

1.4. QUALITY: It is our policy to provide the highest quality measurement services attainable through aggressive implementation of the Quality Program (QP) and continuous improvement of our quality system.

1.5. CERTIFICATION: This laboratory shall demonstrate compliance with T.O. 00-20-14 by maintaining certification through the AFMETCAL Assessment and Certification Program.

1.6. COMMITMENT: Utilizing the following methods the OO/ALC PMEL will strive to continuously improve while always following the path that leads to total traceability and higher standards. We will also provide total product integrity to our customers by ensuring precise and accurate measurement capabilities through world-class technology, engineering, and calibration services.

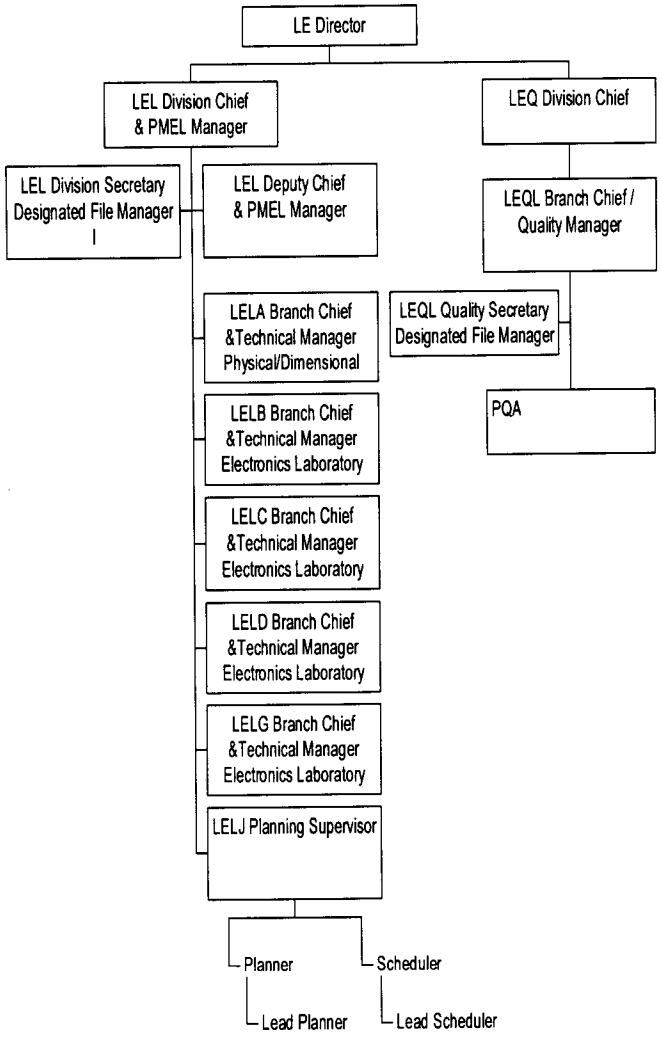
- Total commitment by the entire PMEL to the Quality Program (QP)
  - Root Cause Analysis process (RCA)
  - Problem Solving through Process Reviews (PR's)
  - Focus corrective action efforts through good trend analysis
  - Sharing of information through monthly Quality Review meetings
  - Compliance with all requirements established in T.O. 00-20-14 chapter 9.

- The PMEL management strives to provide the best training that resources will allow ensuring the work force has the ability to perform its mission.
  - The supervisors, technicians and Quality Office are committed to identifying training requirements necessary to perform the required duties.

- The PMEL management is committed to providing a facility and all equipment necessary to accomplish the mission.
  - The supervisors, technicians and Quality Office are committed to identifying facility and equipment requirements necessary to accomplish the mission.

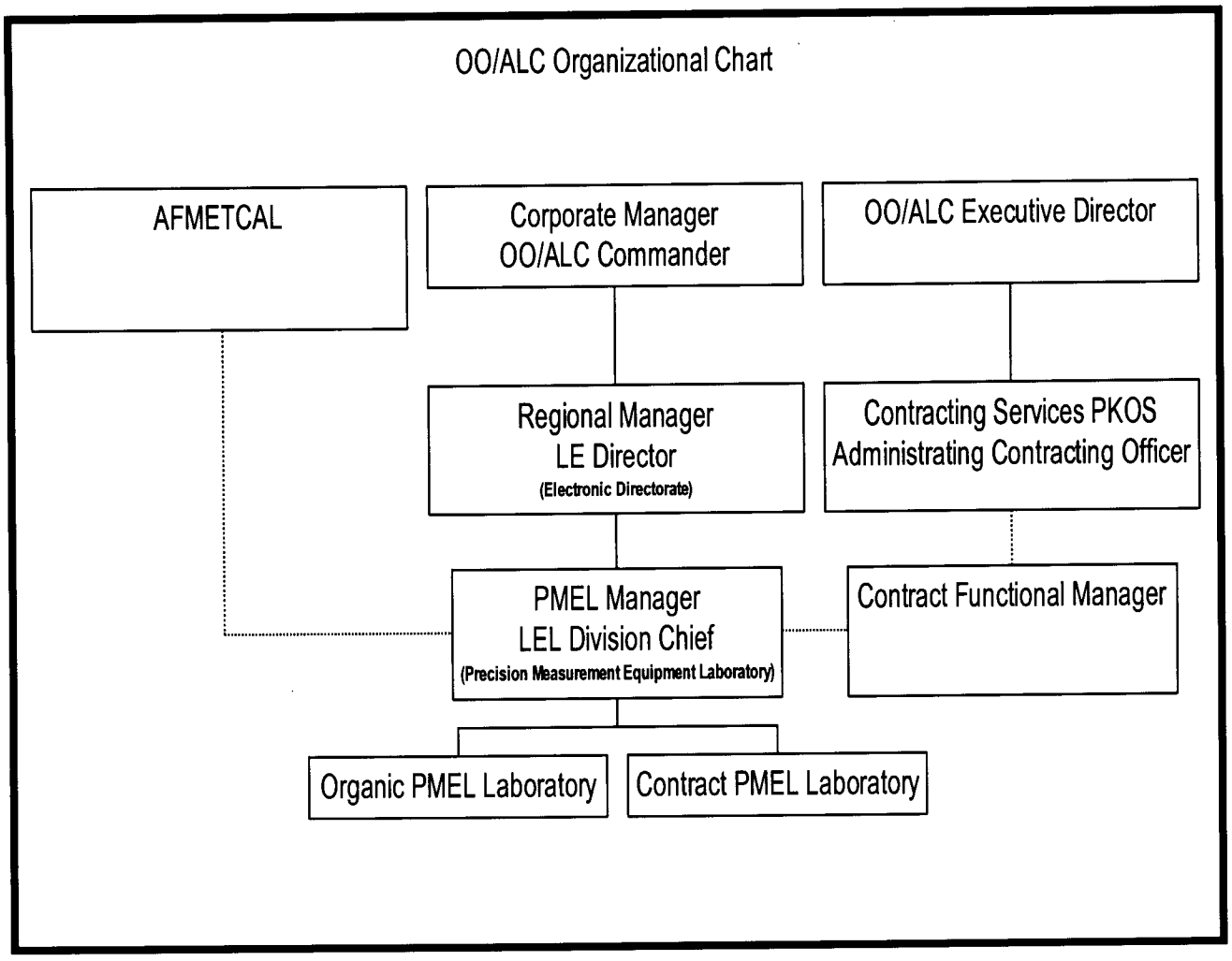
Section 2a

ORGANIZATION AND MANAGEMENT STRUCTURE



Section 2b

ORGANIZATION AND MANAGEMENT STRUCTURE



Section 3
RECORDS

3.1. This section contains the procedures, responsibilities, and authorities for drafting, changing, approving, and issuing quality system documents. This includes the PMEL QM and related quality documentation such as local procedures and forms, internal audits, management reviews, customer complaints, etc.

3.2. All AFMETCAL program PMELs follow T.O. 00-20-14 for laboratory records management and document control. The following paragraphs outline local policies and procedures:

3.3. OFFICIAL DOCUMENTS: All official documents issued by this laboratory will be signed by the appropriate signatory as identified in Section 6. Official laboratory documents will be accomplished in permanent ink. Corrections are accomplished by drawing a line through the entry and then initialing the change. Notes should be included, as necessary, to explain the reason for the change.

3.4. OFFICIAL FILES: The PMEL manager is the official file manager for this laboratory. Day to day file maintenance duties may be delegated, but primary responsibility for all official records will be the PMEL manager.

3.4.1. DELEGATION OF FILE MANAGER: LEL PMEL has two file managers. There is a LEL Division File Manager and a LEQL File Manager. They are listed in 6.2 of this manual. Copies of the official documents will be routed accordingly.

3.4.2. LEL DIVISION RECORDS: All LEL Division records are stored and maintained in the Division Office.

3.5. QUALITY SYSTEM DOCUMENTS: The Quality Manager, as designated in Section 6, is responsible for the accuracy and currency of all quality system documents, including the quality manual and quality tests as outlined in 5.5.3 of this manual. Day to day file maintenance duties may be delegated, but primary responsibility for all official quality records lies with the Quality Manager.

3.5.1. QUALITY MANUAL REVIEW: The Quality Manual will be reviewed IAW Table 1. The Quality Manager and the PMEL Manager must approve and initial any changes to the quality manual. Each Branch Chief will review and initial any changes that are approved in Table 1 of the Quality Manual.

3.5.2. The Quality Manual will be available on the Hill PMEL web page and will be accessible to all personnel. The quality office, via email, will notify all personnel when significant changes are made. The email will be filed electronically in the shared/quality/quality manual/email folder located on the server.

3.5.3. The letter identifying the PMEL Quality Assurance (PQA) Evaluator is filed in the Quality Office and will be reviewed at least annually.

3.6. QUALITY PROGRAM (QP) RECORDS: include, but are not limited to, a signed list designating PQA Evaluators/Augmentees, K-stamp qualification test, audit reviews, monthly summaries, Root Cause Analysis findings, follow-ups, and any trend analysis based on this information. All quality records pertinent to process review, quality review, and standards reviews are filed in monthly folders. Each monthly folder contains that months Index file, AFMETCAL QP Statistics, Non-Conformity % by

Section, QP Inspections, Trend Analysis, and LEL Organic Quality Workload Review. It also contains the audit reviews, Root Cause Analysis, any follow-ups, and the list of organic standards and reviews. These folders are maintained in the Quality Office. The electronic files are found on "Shared on 'hif-fs214tipL'(S:)/Quality/Records" and "Shared on 'hif-fs214tipL'(S)/Quality/Reports".

3.6.1. The Quality Manager reviews all critical root cause analysis (RCA). The RCA is then routed to the PMEL Manager for final review and signature. All signed RCA's are returned to the Quality Office and filed in accordance with Section 3 of this manual.

3.6.2. Active QP records shall be retained IAW T.O. 00-20-14, section 9. Previous records are archived and used for trend analysis. All quality records are filed, secured, and maintained in the Quality Office.

3.7. COMPLAINTS AND CORRECTIVE ACTIONS: Customers are provided a PMEL point of contact (POC). Feedback, questions or complaints will channel through these people. If negative feedback is received, the PMEL Division Chief will be notified and necessary steps will be identified to alleviate the problem.

3.8. POLICY LETTERS: Policy letters are created to define how specific procedures will be accomplished in the PMEL. These letters will be maintained on file in the quality office and electronically on the home page.

3.8.1. The PMEL Manager and the Quality Manager at least 10 days prior to the annual review of the Quality Manual will review all policy letters. The PMEL Manager and Quality Manager will determine at that time what policies will be implemented into the Quality Manual.

Section 4

PERSONNEL

4.1. PMEL MANAGER: The PMEL Manager (PM) at OO/ALC is identified in section 6 of this manual and has the primary responsibility of ensuring all elements of T.O. 00-20-14, section 3.9 are complied with. The PM will strive to guarantee a well-trained work force is in place and that the work force is fully capable of providing equipment, documents and facilities/environment required to complete the mission.

4.1.1 DUTIES: Identifies mission and tasking requirements. Provide sufficient resources to ensure accomplishment and permanence. Designates personnel to key positions providing training and guidance when necessary. Ensures technicians operate and maintain base reference and working measurement standards assigned to the laboratory. Ensures calibration and repair support of TMDE that is designated as a PMEL responsibility in T.O. 33K-1-100 or appropriate CMS for host, tenant, and off-base supported activities. Uses T.O.s 00-20-14, *AF Metrology and Calibration Program,* 33K-1-100, CMSs, AFI 21-113, *Air Force Metrology and Calibration (AFMETCAL) Program,* and AFMAN 32-1094 to maintain PMEL certification. Establishes the Laboratory flight Quality Program in accordance with T.O. 00-20-14. Prepares PMEL report RCS: HAF-ILM (SA) 7808 in accordance with T.O. 00-20-14. Provides a copy to the command functional manager. Ensures the Automated Management System or alternate management information system (MIS) is administered, maintained, and operated in accordance with 33-series Air Force directives. Ensures PMEL management responsibilities outlined in T.O. 00-20-14, Section 3, are fulfilled. Approves priority calibration or repair requests and may delegate this authority.

4.1.2 KNOWLEDGE: The PM possesses an exceptional grasp of Metrology methodologies and practices. Is highly skilled in Program management concepts and applications. As the program focal point the PM must have a clear vision of mission requirements present and future.

4.2. QUALITY MANAGER: The primary purpose of this position is to provide Quality assurance management for the PMEL division. The position is responsible to manage the Quality Program (QP) as required by AFMETCAL to ensure weapon systems accuracy and traceability to the National Institute of Standards and Technology (NIST) and AFMETCAL.

4.2.1. DUTIES: Plans, organizes, administers, manages, and controls the PMEL Quality Program. This encompasses statistical quality assurance, root cause analysis, and planned quality verification. Establishes technical and administrative directives, policies and procedures for the functional operations. Supports directives received from higher authority. Ensures that the activities and accomplishments, within the function are uniform in purpose and achievement, and are in agreement with PMEL Division objectives for planned control; also that quality evidence is compatible, interrelated, and systematically utilized. Ensures that all quality goals are met and that they are within the AFMETCAL guidelines.

4.2.2. KNOWLEDGE: Has a comprehensive and thorough knowledge of the full range of principles, concepts, and methodology related to quality assurance programs and skill in applying this knowledge to all PMEL work assignments. Has a thorough working knowledge and understanding of the program and their quality requirements. Analyzes interrelated PMEL quality issues of effectiveness, efficiency, and productivity. Develops a detailed PMEL quality program.

4.3 TECHNICAL MANAGER: The BRANCH CHIEFS fulfill this capacity; they have demonstrated an exceptional grasp of metrology principles and methodologies along with a keen insight into customer requirements. In addition they are the focal point in resolving technical issues that can't be handled at the

lowest level. As the branch expert in their discipline they forward calibration reports to the responsible agency and coordinates resolutions between customers and technicians.

4.4. PMEL QUALITY ASSURANCE: The primary purpose of this position is to provide Quality Assurance as a technical specialist for the Precision Measurement Equipment Laboratory (PMEL) division. The position is responsible for performing quality audits, evaluating and making recommendations to management to ensure compliance of the Quality Program (QP) as required by AFMETCAL to ensure weapon systems accuracy and traceability to the National Institute of Standards and Technology (NIST) and AFMETCAL. PMEL Quality Assurance (PQA) evaluators are appointed in writing.

4.4.1. DUTIES: Plans, develops, implements and monitors the PMEL Quality Program. This encompasses statistical quality assurance, root cause analysis, and planned quality process and product verification. Recommends technical and administrative policies and procedures for the functional operations. Supports those directives received from higher authority. Serves as technical consultant to production area managers on issues related to quality. Ensures that the activities and accomplishments, within each production area are consistent with requirements as outlined in T.O. 00-20-14 and is uniform in purpose and achievement that are consistent with the Quality Plan (QP) and PMEL objectives.

4.4.2. KNOWLEDGE: Has a comprehensive and thorough knowledge of electronic theory, precision measurement techniques and calibration procedures of mechanical and/or electronic test equipment and Precision Measurement Equipment (PME). Has a broad knowledge of TMDE including pertinent quality characteristics, interrelationships of functional parts and subassemblies, and measurement and test procedures. Has the ability to understand and interpret complicated calibration procedures defined in Air Force Technical Orders, commercial technical manuals, and locally developed procedures in order to determine compliance.

4.5. BRANCH CHIEF: Branch supervisors are an extension of the PMEL manager with subordinate responsibilities to ensure the same items detailed above in 4.1.

4.5.1 DUTIES: Supervises subordinate workers on the maintenance, repair, test, calibration and certification of TMDE ranging from single function electronic instruments to multi-bay integrated automatic test equipment.

4.5.2. KNOWLEDGE: Thorough knowledge of command and local data management systems, which interface with the PMEL. Knowledge of personal computer usage and ability to generate and modify special purpose software programs needed to establish control and provide status of assigned workload. Is knowledgeable of all-general laboratory practices and procedures and AF Occupation Safety and Health (AFOSH) Program requirements.

4.6. PMEL TECHNICIAN: The following sections describe the different responsibilities of PMEL technicians by their skill.

4.6.1. PMEL ELECTRONICS TECHNICIANS:

4.6.1.1. DUTIES: PMEL electronics technicians' key duties are performing calibration and repair of electronic TMDE while ensuring that the processes and procedures meet the AFMETCAL Program requirements.

4.6.1.2. KNOWLEDGE: In order to verify the Air Force Metrology Program requirements are being met, each technician must be knowledgeable of all General Laboratory Practices and Procedures, AF

Occupational Safety and Health (AFOSH) Program requirements, Metrologists Calculations and Error documentation, and the PMEL Measurement and Critique techniques. Each of the practices, procedures, measurement and critique criteria would be linked, but not limited to, the following TMDE areas:

- Measurement Mathematics Calculations
- Multimeters (Analog / Digital)
- Differential Voltmeters and Power Supplies
- AC Voltmeter
- Signal Generators/Test Oscillators
- Distortion Analyzer
- Oscilloscope Calibration Systems
- Time Mark Generator
- Constant Amplitude Generator
- Pulse Generator

Other advanced capabilities accomplished by journeyman electronics technicians include the following:

- Oscilloscope and Waveform Analysis
- Oscilloscopes Measurement and Critique techniques
- Precise Frequency Measurement
- Power Meters and Attenuators
- Frequency Monitor and Electronic Counters
- Signal Generation Measurements

4.6.2. PMEL PHYISCAL / DIMENSIONAL TECHNICIANS:

4.6.2.1. DUTIES: PMEL dimensional technicians' key duties are performing calibration and repair of dimensional TMDE while ensuring processes and procedures meet AFMETCAL Program requirements.

4.6.2.2. KNOWLEDGE: In order to verify the Air Force Metrology Program requirements are being met, each technician must be knowledgeable of all General Laboratory Practices and Procedures, AF Occupational Safety and Health (AFOSH) Program requirements, Meteorologists Calculations and Error documentation, and the PMEL Measurement and Critique techniques. Each of the practices, procedures, measurement, and critique criteria would be linked, but not limited to the following TMDE areas:

- Measurement Mathematics Calculations
- Linear and Angular Measurement
- Optical Measurement
- Temperature, Humidity, Force, and Torque
- Mass and Weight, Specific Gravity, Viscosity, and Flow
- Pressure
- Vacuum, Gas Analysis, and Rotary Motion
- Vibration
- Dimensional Analysis
- Specific Gravity
- Aircraft Engine Test Stand / Calibration Trailer
- Environmental Impact Protection

4.7. PROCUCTION CONTROLLER / SCHEDULER:

4.7.1. DUTIES: Schedules workload and manpower requirements for managing in-shop items and components. Processes and maintains workload requirements. Schedules are established using the proper automated office equipment and systems. In-shop items are tracked through an inventory tracking system (ITS) and the Facility Equipment Management System (FEMS). Ensures work is accomplished in accordance with applicable regulations, directives, reference guides, and established procedures.

4.7.1.1. COMPUTER TRANSPORTATION SYSTEM: The scheduling function is responsible to track all equipment during shipment to the PMEL laboratory and during shipment back to the owner. This is accomplished with a computer program that the schedulers input all DD Form 1149 transactions into. The program tracks the 1149s from advanced copies of TMDE shipped from the customer, 1149 sent to customer on receipt of TMDE, advanced copy of 1149 showing equipment shipped back to the customer, and to the copy of an 1149 from the customer showing receipt of the TMDE.

4.7.1.2. AFTO FORM 45 PREPRATION: Schedulers interface with the Planners for preparation of AFTO 45 Forms either for the laboratory or at the request of a customer. Requests for Calibration Responsibility Determination are coordinated with the customers and established by the Planners or submitted on an AFTO 45 Form to Det. 1, IAW T.O. 00-20-14, for items not listed in the T.O. 33K-1-100-2 or Calibration and Measurement Summaries as applicable.

4.7.1.3. TMDE STATUS: Schedulers maintain immediate real time status for each item of TMDE received and make status available to each customer. Customers are notified weekly when an item of TMDE is placed in delayed status.

4.7.1.4. OVERDUE TMDE: Schedulers furnish customers a weekly report from the Facility Equipment Maintenance System (FEMS) of TMDE overdue calibration and not released by user (NRBU).

4.7.1.5. INPUT: All scheduling input is managed within the following stipulations:

a. Scheduled maintenance will be accepted on due date within a plus or minus five workday window.
b. All unscheduled maintenance will be processed into the lab within seven calendar days of customer notification. Mission essential and emergency unscheduled maintenance will be processed into the lab immediately.
c. When necessary request overtime when turn around time for the month is going to be negatively impacted due to monthly input surges exceeding 30% of the normal monthly input for the last six months.

4.7.1.6. TMDE MASTER IDENTIFICATION LISTING: Provide each customer with a TMDE Master Identification Listing applicable to each OWC upon request.

4.7.1.7. TMDE DUE CALIBRATION FORECAST LISTING: Schedulers provide customers with a TMDE Due Calibration Forecast Listing applicable to their OWC every week. The TMDE Due Calibration Forecast Listing covers a two-week period of equipment due during the next two week time period. A TMDE Due Calibration Forecast Listing is all TMDE due ten days prior to the due date.

4.7.1.8. PRE-SHIPMENT AND POST SHIPMENT INSPECTIONS: Schedulers are responsible to conduct pre-shipment or post-shipment inspection for equipment shipped off-site to another facility for calibration or maintenance.

4.8. MATERIEL CONTROL:

4.8.1.DUTIES: Performs customer order and front-end job order number (JON) edits on all requirements submitted by supported metrology shops. Researches customer requirements and identifies part number/stock number conversions. Ensures appropriate data elements are provided with materiel requests (i.e. standard reporting designator, required delivery date, JON, resource control center, and item document number). Verifies indirect/direct materiel availability, and physically processes customer inputs into supply and maintenance systems. Provides order status and estimated delivery dates to appropriate personnel and DSMC workload managers.

4.8.2. KNOWLEDGE: Possesses a high level working knowledge of management information systems, maintenance tracking systems, material research and ordering systems, scheduling, work loading, planning, and production control computer systems. Possesses a working knowledge of Air Force regulations and technical orders concerning system acquisition / logistics.

4.9. TECHNICAL ORDER LIBRARIAN: The Technical Order Distribution Office (TODO) for the OO-ALC/ PMEL is under a service contract. The contract specifies TODO functions will meet all requirements in TO 00-5-1, 00-5-2, 00-5-3, 00-5-15, and 00-5-18 as established by Air Force Policy Directive (AFPD) 21-3. A general concept overview follows.

4.9.1. ROUTINE INDEX CHECKS: Routine account record checks are performed by all TODO and TODAs that maintain ATOMS AFTO Form 110 records within one month of the receipt of a T.O. Index revision on CD-ROM or once quarterly when using the Internet T.O. Index Application. The account's affected T.O. records will be checked against Part 1 of the revised T.O. Index on the CD-ROM or against the various symbol-marked entries in the Internet application. Library custodians must check Part 1 of a revised CD-ROM T.O. Index (T.O. 0-1-CD-1), or the various symbol-marked entries (Part 2) in the Internet T.O. Index Application, to determine if any newly published T.O.s are required to support the assigned mission. Library custodians will notify the servicing TODA or TODO of changed T.O. requirements. The title page of incomplete T.O.'s will be annotated to show that condition and superseded T.O.'s will be prominently marked "superseded". Superseded T.O.'s may be retained in the library at the discretion of the unit commander, pending receipt, documentation and filing of superseding T.O.'s.

4.9.1.1. DOCUMENTATION OF REQUIRED CHECKS: Routine and annual account records checks are documented in the Remarks window of the corresponding ATOMS record for the Index T.O. (T.O. 0-1-CD-1). Users of the Internet T.O. Index Application will create a special ATOMS record (e.g., "T.O. Index") for documenting routine checks. Library custodians may document their part of routine checks on the T.O. Series Inventory listing provided by the servicing TODO/TODA, if available. Library custodians will annotate annual library inventory checks on the ATOMS T.O. Series Inventory by Account listings (or corresponding ATOMS T.O. Index record).

4.10. EQUIPMENT ACCOUNT MANAGER: The assigned equipment account manager for all industrial equipment (IE) accounts in the PMEL has the following duties:

- Review the existing IE for condition and capability
- Help determine when the IE should be replaced
- Determine if the IE is being used in the most effective manner
- Furnish reports on the IE annual cost depreciation

- Provide visibility and condition of each investment code
- Determine if procurement of new IE is the most feasible and economical alternative
- Project future IE investments for budget considerations
- Report the IE status in the approval acquisition cycle
- Insure IE is properly turned in upon receipt of replacement equipment or justifies its continued use.

4.11. VEHICLE CONTROL OFFICER: The PMEL Vehicle Control Officer is _____. His office is located in Bldg.___ Rm. __. The phone number of the VCO is _____. The VCO is responsible to ensure the PMEL has monthly Vehicle Safety Briefings and the required vehicles to support the mission.

4.12. TMDE MONITOR TRAINING: Monitor training is conducted by the TIU division at OO-ALC or by the planning/scheduling office of the OO-ALC/PMEL.

4.12.1. TIU will conduct the training of TMDE monitor's for a class of six or more students. If there are less than six students, the PMEL planning / scheduling office will conduct the training upon request. This course is given to individuals or small groups including a document stating that the individual has completed the course. The PMEL furnished course is available for original or follow up training as desired. This PMEL training is also available to any off base customers that cannot work funding issues with TIU.

4.12.2. TMDE COORDINATORS: PMEL Schedulers maintain a current listing of government TMDE coordinators. The list includes, as a minimum, OWC number, name and grade of primary and alternate TMDE coordinators, their address, and telephone number(s).

Section 5

TASK COMPETENCE

5.1. Personnel performing tasks will be individually qualified on the basis of appropriate education, training, experience and/or demonstrated skill. A list of all certifying technicians is in Appendix 1.

5.2. PRODUCTION ACCEPTANCE CERTIFICATION (PAC): the individuals' supervisor will maintain an electronic PAC folder for each certifying technician. The PAC folder will be maintained in accordance with AFMCI 21-108.

5.2.1. TASKS REQUIRING SPECIFIC TRAINING: All tasks requiring specific training will be identified in the individual technician's PAC folder. The supervisor will be responsible to ensure all technicians are certified to accomplish specific tasks before assigning work.

5.2.2. TRAINING RECORDS: All training requirements, both core and special will be identified in the technician's PAC folder. The supervisor is responsible to maintain a record of training dates and re-certification requirements as specified in AFMCI 21-108.

5.3. CERTIFICATION K-STAMPS This Quality Manual establishes the internal responsibilities and procedures to request, issue, control, inventory, revoke, recall, and process loss of certification K-stamps within the PMEL Division (OO-ALC/LEL).

5.3.1. The PMEL Quality Office (OO-ALC/LEQL) is responsible for issue, control, and inventory of all organic K-stamps within OO-ALC/LEL. The LEQL Quality Office will manage K-stamps as defined by T.O. 00-20-14 and this Quality Manual. The K-stamp POC is listed in Table 2. A list of all-organic K-stamps issued will be available in the Quality Office and on the PMEL server (hif-fs214tipL'(S:)/Quality/Records).

5.3.2. The LEQL Quality Manager is ultimately responsible for the PMEL K-stamp program at OO-ALC. However the LEQL Quality Manager may assign a stamp monitor (in writing) identifying the responsibilities as they pertain to this manual and T.O. 00-20-14. The delegation memorandum will remain on file in the Quality Office and a Copy forwarded to LEQ Division.

5.3.3. REQUESTS AND ISSUE:

5.5.3.1 When an assigned employee requires a K-stamp, the supervisor will notify OO-ALC/LEQL PMEL Quality Office via e-mail and request the stamp be issued. (The information in the e-mail must include: Employee Name, RCC and Supervisor's Name.) A K-stamp will not be issued until the employee has completed all the required PAC certified training listed in AFMCI 21-108, a PR and testing (listed in this section).

5.3.3.2. It is the supervisors' responsibility to insure that the training requirements as outlined in AFMCI 21-108 are met. It is also the supervisors' responsibility to ensure that the employee is familiar with and understands T.O. 00-20-14, 33K-1-100-1, 33-1-32, AFMCI 21-107, Air Force Occupational Safety and Health (OSH) Standard 91-31 and 91-90. The supervisor's (E-mail) request of the stamp will be an indicator that all requirements have been met. All E-mail requests will be kept on file, located @ hif-fs214tipL(S:)/shared/Quality/Email/PR.

5.3.3.3. Upon receipt of the e-mail, the technician will be scheduled a time for testing in the quality office. The technician must pass a written quiz on his/her knowledge of safety, traceability, tools and Production

Acceptance Certification (PAC) Program. The test may include questions concerning one or all of the references. A minimum score of 70% is necessary to pass. The test will be open book and the technician may reference any or all of the T.O.s, AFMCIs or OSHA Standards' during testing. The completed test will remain on file in the Quality Office.

5.3.3.4. If the technician fails to meet the required minimum score, their supervisor will be notified of the test results. When the supervisor has determined that the technician is ready for re-testing the supervisor will submit another email, requesting re-testing. A different test will be administered.

5.3.3.5. Upon successful completion of testing, the technician will be scheduled for a targeted Process Review (PR).

5.3.3.6. The technician will accomplish a Process Review (PR) with little or no direct supervision or guidance. If the PR does not include T.O. 33-1-32 in its process, the technician must demonstrate proficiency of T.O. 33-1-32 prior to being issued a K-stamp. The stamp will be withheld if any critical nonconformity is found. It may also be withheld on the basis of excess non-critical process errors or on the recommendation of the PQA.

5.3.3.7. Upon successful completion of all requirements, the technician will be issued a K-stamp.

5.3.3.8. The requirements of 5.3.3 apply to all personnel. Two K-stamps have been authorized to OO-ALC / LELJ listed in Appendix 1 of this manual. These K-stamps have been authorized to facilitate scheduling. These individuals do not certify TMDE, however they will complete an annual PR on their process. In addition these individuals will be queried on their knowledge of CAMLS 01-4, 01-6, TO 00-20-14 paragraphs 1.4.21, 1.4.22, and all of 4.5. Only after in-depth knowledge of these CAMLS and 00-20-14 paragraphs has been demonstrated will the K-stamps be issued.

5.3.4. CONTROL:

5.3.4.1. All tests and score sheets will remain under the direct control of the Quality Manager or designee.

5.3.4.2. All K-stamps not issued will remain under the direct control of the Quality Manager or designee.

5.3.4.3. ANNUAL INVENTORY: The PMEL Quality Manager or designee will conduct an annual inventory of K-Stamps.

5.3.4.4. The PMEL Quality Office will send a K-stamp listing, by RCC, to each supervisor. The listing will contain the name and K-stamp number of all technicians assigned K-stamps. The RCC supervisors will have the employees place their stamp impressions next to the stamp number on the listing. The supervisor will inspect the stamp impression to ensure it is the correct number and is legible. Any discrepancies will be noted on the listing. The supervisor will sign and date the listing when the inventory is complete. If no discrepancies were noted, the listing will be forwarded to OO-ALC PMEL Quality Office. If discrepancies are noted, the supervisor will direct the employees to contact OO-ALC PMEL Quality Office to reconcile any stamp number discrepancies.

5.3.4.5. OO-ALC PMEL Quality Office will keep the inventory listing on file until the next year's inventory is complete.

5.3.5. REVOCATION / RECALL:

5.3.5.1. The revocation of an individual's K-stamp can only occur at the branch or division level within OO-ALC PMEL. If revocation occurs, the circumstances of the action will dictate the appropriate documentation requirements and future reissue of a K-stamp.

5.3.5.2. At least 30 days prior to the lapsing of a required PR; the technician's supervisor will be notified via email, stating the name and stamp number of the technician and the date the PR will lapse. The email will be electronically filed on the quality folder. In the event the technician has not completed the PR and the time for completion has lapsed, the PMEL Quality Office will email the LEL Division Chief and c.c. the technician's supervisor informing them that the technicians K-stamp is no longer valid, due to lack of compliance in accordance with the PMEL Quality Manual (see section 10.13) and request that the technicians K-stamp be surrendered immediately to the OO-ALC PMEL Quality Office.

5.3.5.3. If the technicians K-stamp has been revoked, the technician will not be reissued a K-stamp until he/she completes all the requirements of 5.5.3 of this manual.

5.3.6. TERMINATION OR REASSIGNMENT: In the event that an individual is terminated or is reassigned to a position outside of OO-ALC PMEL or to a position no longer requiring a K-stamp, the individual's supervisor will direct the individual to turn in the assigned stamp to the PMEL Quality Office. Stamps turned in will not be reissued for one year.

5.3.7. LOSS: The loss of a K-stamp will be reported, without delay, to the immediate supervisor. If the loss is suspected to have occurred in a foreign object damage (FOD) critical work area, a reasonable search will be conducted. If the search fails to locate the K-stamp, a lost report will be initiated (reference AFMCI 21-107, Tool Control and Accountability Program). OO-ALC/LEL PMEL Quality Office will document the loss in the K-stamp database and alert other areas within the appropriate division of the loss via electronic mail.

5.3.7.1. A stamp reissue request from the assigned supervisor will be required prior to another stamp being issued.

5.3.7.2. OO-ALC PMEL Quality Office will maintain the status of lost stamps in their database for 3 years. The lost K-stamp number will not be reissued for one year.

5.3.7.3. Any K-stamp found will be reported to 00-ALC/LEQL PMEL Quality Office for identification and action. If the K-stamp is found in a FOD critical work area, the procedures for found tools will also be accomplished as required by AFMCI 21-107.

Section 6

SIGNATORIES

6.1. This section identifies the signatures required and specific personnel authorized to sign or approve laboratory documents. Signatories are selected, and appointed in writing, based on their qualifications to make the required decision. Signatories of calibration results are responsible for releasing a complete and accurate document.

6.1.1. NOT REPAIRABLE THIS STATION (NRTS) letters: The technician, branch chief, and the division chief all sign this letter.

6.1.2. ROOT CAUSE ANALYSIS (RCA): The quality manager and the division chief must sign all critical RCAs.

6.1.3. PMEL PRIORITY REQUESTS: This request must be signed by the owning work center's Group Commander or designated representative.

6.1.4 TMDE CALIBRATION EXTENSION REQUESTS: This letter is required to request an extension of a scheduled due date on any TMDE. The PMEL Manager must sign this letter. Utilization of this request will be accomplished in accordance with T.O. 00-20-14 section 3.4.9 through 3.4.14. Final approval of this request will come from the MAJCOM functional area manager.

6.1.5 EQUIPMENT CONDITION TAGS: All equipment condition tags will be stamped / signed and dated by the branch chief or designated alternate in accordance with AFMAN 23-110.

6.1.6. FILE MANAGERS:

6.1.6.1. The LEL Division File Manager will maintain the LEL Division PMEL filing system. The file manager is authorized to receive, review, route and maintain documents pertaining to, and for the purpose of upkeep of any LEL Division PMEL records that pertain to daily operations.

6.1.6.2. The LEQL Quality File Manager will maintain the LEQL PMEL Quality filing system. The file manager is authorized to receive, review, route and maintain documents pertaining to, and for the purpose of upkeep of any LEQL PMEL Quality records that pertain to daily operations.

6.2 Personnel Assigned to Management Positions: are per Table 1:

Table 1

*PMEL Management Team

LEL Division Chief	
LEL Deputy Division Chief	
LEL Division File Manager	
LEQL Branch Chief / Quality Manager	
LEQL File Manager	
LELA Branch Chief / Technical Manager	
LELB Branch Chief / Technical Manager	
LELC Branch Chief / Technical Manager	
LELD Branch Chief / Technical Manager	
LELG Branch Chief / Technical Manager	
LELJ Planning Supervisor	
Technical Order Distribution Office (TODO)	

Section 7

ACCEPTING NEW WORK

7.1. This section contains the procedures for reviewing new work, such as local procedures for completing AFTO Forms 45. This ensures the PMEL has the appropriate support agreements, facilities, equipment, standards, and technical expertise necessary to support items new to the PMEL inventory.

7.2. The Laboratory will accept new work as directed by Air Force Technical Orders, Instructions, Major Command policies, and Support Agreements.

7.3. INITIAL CALIBRATION:

7.3.1. APPROVAL: All competition/BRAC and new type TMDE workload for the OO-ALC/PMEL must be coordinated through the PMEL Planning Office. This office will evaluate responsibility determination for the workload. The evaluation will include whether an existing determination is in a CMS, T.O. 33K-1-100-2, or if a responsibility determination is required by AFMETCAL Det 1. If a responsibility determination is required, the LEL planners will submit an AFTO Form 45. If the item is needed by the OWC prior to receipt of determination, the user will be responsible for any calibration/maintenance requirements; PMEL will assist if requested and capable.

7.3.2. SCHEDULING: Requests for initial calibration will be reviewed and approved/disapproved by the Planning/ Scheduling Office or other authorized individual appointed by the LEL Planning Manager. For competition/BRAC and new type TMDE work, an evaluation by the PMEL Planning office will be accomplished before the workload is scheduled through the PMEL Type II service contract scheduling function or the PMEL organic scheduling function. Once the planning evaluation has been accomplished, the scheduling section will schedule the work on a first in first out basis. The point of contact for scheduling initial calibrations is the Lead Scheduler identified in Section 2a.

7.3.3. CAPABILITY: For all new work the PMEL planning office will verify calibration equipment capability and ensure calibration procedures exist at OO-ALC or coordinate with the owner/user to establish all 33D, 33A, or commercial manuals within their T.O. libraries. For those items requiring 33K procedures the PMEL will coordinate with the T.O.D.O. supporting contractor to establish the procedures in the PMEL T.O. library. For those items that the calibration capability does not exist at OO-ALC the PMEL will act as coordinator to establish parallel calibration support at another Air Force or alternate government facility. If parallel support from a government agency is not available the PMEL will work with the owner to obtain approval from AFMETCAL Det 1 for the owner to seek commercial calibration.

7.4. Priority maintenance will normally not be approved on initial calibrations; however, priorities will be considered if accompanied by a letter of justification. The letter of justification must follow the format provided by OO-ALC/PMEL Scheduling Office and be signed at the appropriate level.

7.5 PARALLERL SUPPORT:

7.5.1 All parallel support provided by OO-ALC/PMEL will be requested through and authorized by the government PMEL planning office. Each request must be in accordance with T.O. 00-20-14, Section 4, Paragraph 4.1.

7.5.1.1 Additional information not identified by T.O. 00-20-14 will include.

a. User/Owner identification

b. User/Owner address

7.5.2 Each parallel support task authorized by the government PMEL planning office will have addressed the following:

a. Funds site availability

b. Calibration standard availability

c. Status of calibration standard

d. Manpower availability to determine turn around time

e. Approximate delivery time of TMDE for parallel support

7.5.3 Notification by FEMS number will be provided, by the government planning office, to the appropriate PMEL scheduling office of pending delivery date for parallel support TMDE. Upon arrival of the TMDE the steps to route the TMDE follow:

a. Add the TMDE to FEMS with the sending organization as the owning work center (OWC) and add in the long description "It is parallel support".

b. The AFMC Form 134 accompanying each item will be marked as parallel support.

c. When completed the organization that sent the TMDE will be contacted and notified of all appropriate data to update their TMDE tracking system. If that organization is not the user/owner the TMDE will be shipped back to the user/owner. The TMDE will be deleted from the OO-ALC/PMEL FEMS.

Section 8

CALIBRATION PROCEDURES

8.1. This section contains or references local procedures for requesting, posting, controlling, and using calibration and maintenance procedures. Refer to T.O.s 00-5-1, 00-5-2, and 00-20-14 for specific Air Force and AFMETCAL guidance.

8.2. CALIBRATION PROCEDURES: Personnel will sign out procedures using an AF Form 614, Charge Out Record. The signed AF Form 614 will be placed in the spot where the Calibration Procedure has been removed.

8.2.1. CALIBRATION INTERVAL: The CMS and the 33K-1-100-2 list all calibration intervals in months. The OO-ALC FEMS system lists all frequencies in days. The following procedure will be used when converting months to days for the purpose of calculating the next date due:

a. Each month will be converted to 30 days up to 11 months
b. 12 months will be converted to 365 days / 24 months will be 730 days etc...
c. Odd months in excess of 12 month intervals will be calculated utilizing the following examples:
   - 15 months = 455 days [12 mos.(365 days) + 3 mos. (90 days) =455 days]
   - 25 months = 760 days [24 mos.(730 days + 1 mo. (30 days) = 760 days]

8.2.2. PMEL CALIBRTION CHECKLIST: This checklist was created as an aid to help ensure mandatory steps are accomplished and calibrations are IAW published directives and traceable to NIST through the AFPSL.

8.2.2.1. CHECKLIST AVAILABILITY: The Quality Office will ensure that the most current revision of the OO-ALC calibration checklist is available on the PMEL Home Page.

8.2.2.2. MANDATORY USE OF THE CHECKLIST: The checklist will be used for all work order tasks performed. Any exception must be approved in writing from the PMEL Manager prior to performing any tasks.

8.3. TECHNICAL ORDERS: Personnel will sign out T.O. using an AF Form 614, Charge Out Record. The signed AF Form 614 will be placed in the spot where the T.O. has been removed.

8.3.1. TECHNICAL ORDER INDEX: Technicians will access the following web site to verify T.O. dates: toindex-srobins.af.mil/toindex/. The date in the index reflects the T.O. change date and the estimated distribution date. If the Estimated Distribution Date (EDD) listed in the index is within 6 weeks of the most current T.O. on file, use of the file T.O. is authorized. This will allow a reasonable amount of time for the T.O. distribution process. If the file T.O. is beyond 6 weeks of the EDD contact the Quality office prior to use.

8.3.2 CALIBRATION SOFTWARE: Technicians will verify the current revision of calibration software using the Automated Calibration Program Identification Number System (ACPINS) web site http://wbcpins.tinker.af.mil

8.3.2.1 The software label will have the current CPIN number and Revision number as verified from the ACPINS web site. If the software is already loaded on the system, and the CPIN number and Revision number can be verified on the screen or the print out, the software does not need to be reloaded.

8.3.2.2 For calibration software that is restricted or proprietary and does not have a CPIN; the user will provide Validation and Verification documents to the PMEL IAW T.O. 00-20-14, 3.1.5.1. Technicians will not use this software without approval from the Quality Office. A copy of the Validation and Verification will be kept on file in the Quality Office.

8.3.2.3. All situations not falling within the scope of this manual will be elevated to the PMEL Division Chief.

8.3.3. TECHNICAL ORDER VERIFICATION (TOV): All draft Technical Orders that require verification will be routed and tracked through the LELJ Planning/Scheduling Office, ____Name_____, Phone. TOV's received from AFMETCAL Det 1 will be complied with and returned by stated deadline of the TOV.

8.3.3.1. The Planning/Scheduling office will distribute the TOV to the RCC Supervisor and the Quality Office.

8.3.3.2. A workload item, for the TOV, will be scheduled through the FEMS system or with funding from the owner. The TOV will be targeted as a PR for tracking purposes and a PQA will be assigned to assist. Technicians will contact the Quality Office before starting the TOV.

8.3.3.3. TOV's received directly by a technician or supervisor will be given to the Planning/Scheduling Office for proper handling.

8.3.3.4. The Quality Office will monitor the TOV for time compliance.

8.3.4. USE OF AFMC FORM 202 AND AFMC FORM 252: The use of the AFMC Form 202 and AFMC Form 252 will be IAW with AFMCMAN 21-1. The use of these forms will usually occur when a technician identifies an unauthorized modification to a test stand that impacts the completion of the calibration process. It may also occur when published technical data is not adequate. Technicians shall advise the OWC to submit the AFMC Form 202.

8.3.4.1. AFMETCAL Det 1 is the only authority that may issue an AFMC Form 202 or AFMC Form 252 for 33K series Technical Orders and Calibration Measurement Summaries.

8.3.4.2. Technicians may use an approved AFTO 22 when an AFMC Form 252 that is annotated or stamped by the Technical Content Manager (TCM) "Approved for Implementation" accompanies it and it is posted in the current T.O.

8.3.4.3. Technicians may use an issued AFMC Form 202 for a permanent T.O. change when:

a.) It is issued by the responsible engineer or ES
b.) It is accompanied by a fully coordinated and approved Special Handling AFMC Form 252 (SH252)
c.) Both the AFMC Form 202 and SH 252 are posted in the current technical order.

8.3.4.4. An AFMC Form 202 is authorized for use only until the deficiency is corrected or for a maximum of 120 days. An approved AFMC Form 252 or SH 252 is authorized for use at the depot facility until receipt of a formal T.O. update incorporating the data.

8.3.4.5. All situations not falling within the scope of this direction regarding the use of AFMC Form 202 and AFMC Form 252 will be elevated to the PMEL Division Chief.

8.4. COMMERCIAL DATA/PUBLICATIONS: Personnel will sign out commercial data using an AF Form 614, Charge Out Record. The signed AF Form 614 will be placed in the spot where the commercial data has been removed.

8.4.1. Commercial publications used to certify TMDE will be validated by the technician prior to use.

8.5. The Technical Order Distribution Office (TODO) will process requests through the PMEL planning office or the PMEL TMDE coordinator for additional commercial manuals (data) identified as required but not currently in TODO commercial publication library.

8.6. Commercial data Technical Orders will be stamped with the date received by the T.O.D.O.

8.7. Commercial data Technical Orders will be posted by the T.O.D.O.

8.8. Our commercial data manager is NAME , Phone _____ Duty Hours 0600-1530. The commercial data manager will ensure that adequate and current commercial data and catalogs are available. The commercial data files will be reviewed annually and the review documented.

8.9. PROCESSING AND HANDLING OF TMDE: OO-ALC PMEL will process, track, and handle TMDE as directed by Air Force Technical Orders and Instructions. OO-ALC PMEL will handle, prepare, and store TMDE, in its custody, in such a way as to prevent loss, deterioration, damage, or destruction.

8.10. SCHEDULING OF TMDE: The following processes describe the local procedures for scheduling of TMDE.

8.10.1. MAINTENANCE PRIORITIES: Scheduling TMDE is accomplished in accordance to the maintenance priority identified by the customer as routine, mission essential or emergency, per T,O. 00-20-14.

8.10.1.1. ROUTINE MAINTENANCE: First in first out scheduling for TMDE requiring routine calibration/repair is accomplished when received or requested by the customer.

8.10.1.2. MISSION ESSENTIAL MAINTENANCE: TMDE requiring this level of support will be scheduled ahead of routine maintenance and will be the next item worked in the appropriate section during normal work hours.

8.10.1.3. EMERGENCY MAINTENANCE: TMDE requiring emergency maintenance will be scheduled ahead of routine and mission essential maintenance. Maintenance will be accomplished on a non-stop basis until the item has been completed and returned to the customer or until it has been determined that the item requires repair which cannot be accomplished in time to satisfy the stated requirement. In the latter case, immediate notification to the Owning Work Center (OWC) supervisor/shift supervisor is mandatory.

8.11. RECORDS, FORMS AND ANCILLARY EQUIPMENT: Schedulers advise customers and request prompt delivery of records and forms, accessories, and ancillary equipment that are essential for TMDE servicing when those items are missing. Schedulers return the TMDE to the customer without action if missing items are not received from the customer within 2 workdays for on base or 7 workdays for off base customers.

8.11.1 Technicians will immediately inform scheduling if records, commercial data, forms, accessories or any other required item is missing that will prevent calibration or maintenance from progressing.

Scheduling will immediately contact the OWC for assistance in procuring these items. If outside scheduling hours, technician will make contact directly. If required items are not received that day, the TMDE will be put in deferred status until items are received. If not received within 5 duty days, the item will be processed back to the OWC for further action.

8.11.1. All AFMC Forms 202/252's will be processed in accordance with AFMC MANUAL 21-1, chapter 5.

Section 9

LABORATORY TMDE

9.1. This section outlines local procedures to ensure calibration, verification, and maintenance (including preventive maintenance) of equipment owned, rented, or leased by the PMEL.

9.1.1. TMDE DIRECTIVES: All laboratory TMDE owned, rented, leased, or borrowed, having an effect on the results of the calibration services produced will be calibrated, verified, and maintained in accordance with T.O. 00-20-14, Air Force T.O.'s, instructions, or applicable commercial data.

9.2. TMDE MONITOR: The PMEL laboratory TMDE coordinator is NAME, PHONE, and duty hours- 0600 – 1530. Alternate TMDE coordinator is NAME, DSN PHONE, with the same duty hours.

9.3. LABORATORY TMDE:

- Will be scheduled at a higher priority than routine.
- Will be scheduled ten working days before the calibration due date.

9.4. TMDE THAT IS CALBRATED / REPAIRED BY OTHER THAN PMEL:

- Will be inspected (and recalibrated if capability exists) before use.
- Will be inspected before and after shipping to insure that all accessories are included, seals are intact, all documentation is correct and the physical condition is acceptable.

9.5. CHANGES IN FEMS:

9.5.1.1. Only the PMEL planning / scheduling office is authorized to make changes to TMDE standards in the FEMS system.

9.5.1.2. No TMDE standards will be added, deleted or changed without coordination and authorization from the PMEL planning / scheduling office supervisor "or" the contract oversight office chief or their designated staff person for this function.

9.6. PERIODIC MAINTENANCE INSPECTION (PMI):

9.6.1. The Type IIA Contract PMEL is responsible to perform PMI's for PMEL Laboratory Standards. This will be accomplished during regularly scheduled calibration or when necessary.

9.6.2. The Organic PMEL is responsible to perform PMI's for PMEL Laboratory Standards when they are the performing RCC. AFTO 244's will be used IAW T.O. 00-20-5, 7-2.3.

Section 10

QUALITY PROGRAM

10.1. This section contains internal quality assurance objectives and practices. This includes specific management policies for meeting requirements of the QP.

10.1.1. INTERNAL PMEL QUALITY AUDITS: The LEL Division Chief will appoint individuals with a working knowledge of the requirements of T.O. 00-20-14, as auditors, to accomplish an independent annual review to ensure that PMEL is in compliance with T.O. 00-20-14.

10.2. The Senior PMEL Quality Assurance Evaluator/Quality Manager is identified in the organization Chart of section 2 and Table 2 of this manual and is responsible to ensure a Quality Program (QP) is established and operated in accordance with T.O. 00-20-14.

10.3. PMEL Quality Assurance (PQA) Evaluators/Augmentee's identified per Table 2 of this manual are responsible for performing audits, root cause analysis, and follow ups for quality reviews (QR), process reviews (PR), and standard reviews (SR).

10.3.1. All PQA's and Augmentee's are identified in writing. The letter is signed at the division level and filed in the quality office.

Table 2

Senior PQA Evaluators	**Phone**	**Duty Hours**
PQA Evaluators	**Phone**	**Duty Hours**
Augmentee's	**Phone**	**Duty Hours**

10.4 QUALITY REVIEWS (QR): When calibration of TMDE is complete it will be closed in FEMS. If the TMDE has been selected for a QR, it will be identified on the FEMS screen. When FEMS has identified the QR, the technician will contact the quality office as soon as possible and inform them that there is a QR. A PQA will then be assigned and will coordinate the time to perform the review. If a PQA is not immediately available to perform the QR, personnel assigned to the PMEL Quality Office will place, a quality stamped AFTO Form 55, Calibration Void sticker, on the TMDE to ensure the integrity of the inspection. . Failure to comply may result in process non-conformity

10.4.1. QR SELECTION RATE: Percentages will be set based on the previous 6 months history, but no lower than what is stated in T.O. 00-20-14. (See Table 3 of this manual.)

10.4.2. AFTER NORMAL DUTY HOURS: Any routinely scheduled work that is completed after normal duty hours (0600 – 1600 hrs.) will not be processed in FEMS until the next normal workday. If the TMDE is a documented mission essential priority, the technician will complete FEMS that day and return the TMDE to the owner. If that TMDE draws a QR, the technician will contact the Quality Office the next normal workday for guidance.

10.4.3. SUB-WORK ORDERS: When an item is re-calibrated due to a failure during a quality review (QR), a sub-work order will be generated by the performing RCC. The supervisor will generate a sub-work order and attach it to the original work order. The re-work time will be captured on the sub-work-order. The sub-work order will be susceptible to selection for either PR or PR audit.

10.4.4. OFF BASE/TDY: This issue is being addressed.

10.5. PROCESS REVIEW (PR): When an item is scheduled in PMEL, it is loaded into the FEMS system. FEMS will randomly select PR's. Before a technician begins work on any PR selected, the quality office will be notified and a designated PQA will be dispatched to perform the review. The Branch Chief may bypass a PR on a documented mission essential priority. The Branch Chief will provide the priority documentation to the Quality Office.

10.5.1. PR SELECTION RATE: Percentages will be set based on the previous 6 months history, but no lower than what is stated in T.O. 00-20-14. (See Table 3 of this manual.)

10.5.2. PROCESS IMPROVEMENT MODEL: The process improvement model as stated in T.O. 00-20-14 section 9 will be implemented in OO/ALC PMEL Root Cause Analysis Process.

10.6. STANDARDS REVIEW (SR): If more than 100 standards are subject to review then the applicable number of standards will be selected according to minimum sampling percentages outlined in T.O. 00-20-14. After the standard is selected for review a PQA will be assigned to perform the review

Table 3

QP Sampling Percentages

Previous 6 mos. Critical N/C rate on QR's	**QR** selection Rate will be:	**PR** selection Rate will be:	**SR** selection Rate will be:
10% or less	3%	1%	1%
10.1% to 15%	3.5%	1.5%	1.5%
15.1% to 20%	4%	2%	2%
20.1% to 25%	4.5%	2.5%	2.5%
25.1% to 30%	5%	3%	3%
Above 30%	6%	4%	4%

10.7. QP FLOW CHARTS: A start to finish flow chart, outlining the QR, PR and SR action process, can be found in Appendix 2 of this manual.

10.8. ON-SITE CALIBRATIONS: On-site calibrations requiring test instrument soak time in excess of one work day, the temperature be recorded and held for two months. At this time it can be disposed of. Within this time frame data should be readily available for validation, if instrument is selected for inspection.

10.9. FAILURE OF FEMS:

10.9.1. Routine work orders will not be complete until FEMS is functional.

10.9.2. Priority work orders will completed as follows:

- The performing technician will contact the Quality Office.
- Four coins will be shaken for each priority.
- In order for a priority item to be selected all four coins must come up heads.
- If the priority item is selected, a designated PQA evaluator will observe the calibration.
- If the priority item is not selected, the technician will return the item back to the owner and complete FEMS as soon as the system is back on line. After FEMS is back on line, if the item is then selected as a QR, the technician will contact the Quality Office. The QR will be bypassed, and an explanation will be entered in the long description.

10.10. ROOT CAUSE REVIEWS: The Division Chief will review all RCA evaluation forms to determine if any sections or areas require attention or modification to enhance the efficiency and quality of the lab.

10.11. TREND ANALYSIS: will be performed, by the Quality Office to determine if trends are evident in any areas such as:

- Root cause codes
- QP codes
- Type of equipment
- PMEL RCC

If any area shows evidence of negative trends the Division Chief and / or PMEL Manager will be notified.

10.11.1 TRAINING RELATED NONCONFORMITIES: All non-conformities that have a root cause code, indicating training needs, will be given to the appropriate branch chief. That branch chief and the quality manager will evaluate the trends and identify solutions.

10.12. AUDITS OF ALL MAJOR PROCESSES: The quality manager will be responsible to ensure that all major processes in the PMEL are periodically reviewed.

10.12.1. CALIBRATION: The FEMS system is set up to randomly select a pre-determined % of TMDE items being scheduled for periodic calibration. The Quality Manager, as needed, may change the % rate. QA work orders are automatically generated for the quality section.

10.12.2. REPAIR AND/OR MATERIAL CONTROL: If during the PR process the technician determines an item is in need of repair, parts, or both, the PQA will observe the process (s) accomplished.

10.13. AUDITS: Each technician is required to complete two PR's a year and at least six months apart. The Quality Office will track the PR's and the technicians will be notified IAW 10.13.2 of this manual.

10.13.1. AUDIT RECORDS: The quality office will maintain a record of all inspections for the previous 12 months. This record will include date of inspection, type of inspection, technician's name and K-stamp number, and all non-conformities that are identified. The information from this record will be used to keep the supervisors informed of technicians that have not completed an annual PR and to help identify any training requirements.

10.13.2. AUDIT NOTIFICATION: Each RCC supervisor is sent a monthly TQP Inspection Report of all audits completed for the previous twelve months. This report includes the technicians name, K-stamp number, success rate and the date of the next PR due.

10.14. NONCONFORMITIES (NC): When trends indicate that the PMEL is functioning below an acceptable level, as determined by the PMEL Management Team, a root cause analysis (RCA) will be required on all critical nonconformities. The RCA will consist of the process owner, the supervisor, and the PQA meeting together to determine the actual cause of the problem, a solution, and a method of sharing their findings.

10.14.1.DOCUMENTATION: Documentation of all nonconformities will be maintained in the quality offices.

10.14.2.EVALUATION REVIEW: The PMEL Manager and Quality Manager will review all critical RCA's.

10.14.2.1. FOLLOW-UP: A suspense date of no more than 30 days will be established for any action deemed necessary in the evaluation. The PQA will follow up on the resolution to ensure that it was accomplished. If it hasn't been accomplished within the agreed time, the PQA may extend the time an additional 30 days. If at the end of the second 30 days it is not resolved, it will be forwarded to the Quality Manager and PMEL Manager for action.

10.14.3. CROSS TALK: Major findings will be shared in two ways:

1. Quarterly Quality Review meetings.
2. Displayed on the local Hill PMEL Home Page.

10.15. QR SELECTION FOR OFF BASE / ON SITE TMDE: Selection for items located more than 20 miles from Hill AFB (with the exception of those at Little Mountain) will be accomplished in the following manner: With a PQA present, the technician will change the FEMS work document status to INPRG and then COMP. Upon changing the status to COMP, if FEMS selects it for a QR, the status will again be changed to INPRG and a PQA will accompany the Technician / Team to observe and verify the calibration. If the item is not selected for QR, the long description of FEMS will be documented with " This item was completed early in FEMS, to allow for potential Quality Review selection".

10.16. PMEL HOME PAGE: An HTML PMEL Home Page will be maintained on the PMEL server. The home page will contain or link pertinent information as necessary to perform calibrations. The Home Page is maintained by the PMEL Quality Office and updated as necessary.

10.18. PRODUCT QUALITY DISCREPANCY REPORT (PQDR): When the PMEL is notified of any PQDR's; the following steps will be implemented.

10.18.1.QUALITY OFFICE: The Quality Office will ensure all PQDR's are processed in accordance with T. O. 00-35D-54 (USAF Deficiency Reporting and Investigating System).

10.18.1.1. PROJECT FILE: The Quality Office will maintain a folder for each PQDR. A copy of the PQDR, Project Record and Investigation Sheet will be included in the folder. "Information-only" PQDR's will not require a folder but will be maintained on file for at least 1 year and the appropriate PMEL Branch Chief will be notified.

10.18.1.2. DATA TRACKING: PQA will submit a record of investigation findings to PQDR point of contact to be entered into the VAX DSS database system.

10.18.1.3. NOTIFICATION: The Scheduling Office will notify the Quality Office when a PQDR exhibit is available for scheduling into the shop.

10.18.1.4. INVESTIGATION: The PQA will facilitate the meeting of assigned personnel for the PQDR investigation. The PQA will monitor the PQDR investigation.

10.18.2. SCHEDULING RESPONSIBILITIES: The PMEL scheduling office will be responsible to accomplish the following items for PQDR's.

10.18.2.1. EXHIBIT: Scheduling will:

- Order the exhibit from the warehouse for processing when notified by the Quality Office.
- Handle the exhibit as a high priority item and follow-up until the exhibit is received.
- Once received, ensure the exhibit is held in a secured, minimum access area until the investigation.
- When the exhibit is received scheduling will notify the Quality Office prior to opening.
- Scheduling will ensure that proper funding is in place to order the exhibit into the production shop.

10.18.2.2. WORK CONTROL DOCUMENTS: Work Control Documents (WCD) must accompany the item and the WCD will be identified as "PQDR".

10.18.2.3. EXHIBIT DISPOSITION: Scheduling will oversee the appropriate exhibit disposition following the investigation based on its condition.

10.18.3. PMEL LAB RESPONSIBILITIES: LELA, LELB, LELC, LELD, LELG PMEL labs will be responsible to accomplish the following items for a PQDR.

10.18.3.1 INVESTIGATION PROCESS: Investigations will be conducted by a certified technician and monitored by a PQA ASAP upon receipt of the exhibit.

10.18.3.2 INVESTIGATION RECORD: All individuals involved in the investigation and corrective / preventive action will sign the coordination portion of the PQDR project record in the PQDR folder.

10.18.3.3 CORRECTIVE ACTION: PMEL lab Branch Chief will take necessary corrective action to prevent recurrence of the reported defects with special emphasis on workmanship caused deficiencies.

10.19. INTERNAL REVIEWS: The PMEL management team will meet at least bi-annually to review trends and data collected by the quality office. This will occur more frequently if deemed necessary by the Division Chief.

Section 11

RECALL AND NOTIFICATIONS

11.1. This section contains the decision process for recall of TMDE when a PMEL standard or critical customer-owned TMDE is found to be out of tolerance (when root cause analysis determines the out-of-tolerance condition could have affected Air Force mission systems). This element includes nonconformities discovered during QP reviews, internal audits, and management reviews.

11.2. Refer to T.O. 00-20-14, for specific AFMETCAL recall and notification policy.

11.3.2. The decision to initiate a recall is made by the LEL PMEL Division Chief.

11.3.3. When a recall is initiated the LELJ PMEL Scheduling Supervisor will establish a recall schedule and notify customers.

11.4. Customer work center supervisors will be notified when their TMDE is found to be out-of-tolerance by more than 6 percent.

11.4.1. The technician will notify the branch chief of any TMDE found to be more than 6 percent out of tolerance.

11.4.2. The branch chief will investigate potential impact of the out-of-tolerance condition. If necessary, he/she will contact the owner/user and advise them of the impact.

11.4.3. An out-of-tolerance notification letter will be returned with the TMDE to the customer work center supervisor when an item is found to be out-of-tolerance more than 6 percent.

Section 12

EXCEPTIONS AND LIMITATIONS

12.1. This section contains PMEL management's policy and process for permitting departures from calibration procedures, such as, permitting limited and special calibrations. Including the local process for permitting exceptions to published calibration determinations, such as, calibration interval and calibration responsibility.

12.2. All exceptions and limited calibrations conducted by an AFMETCAL program laboratory will be done in accordance with Air Force calibration procedures and T.O. 00-20-14.

12.3. When a tolerance parameter can not be met during the calibration, the calibrating technician will contact the owning work center supervisor to determine if the parameter can be limited and meet mission requirements.

12.4. PMEL may not limit a calibration without the expressed approval of the owner/user unless the limitation is directed by an authorized calibration procedure. The technician will explain the limitation to the owner / user. Upon approval the owner / user will initial the user approval block on the limitation label indicating agreement with the limitation. Once the owner / user is contacted by telephone, a note in the long description block in FEMS will be made to indicate approval. The note will contain all pertinent information. E.g. Name, organization and phone number. When completing the work order in FEMS, the type of report needs to be noted as Y in the limited block.

12.4.1. A technician will never limit a calibration that has a direct impact on the safety of the item or the personnel using it.

12.5. When a limited calibration is directed by an authorized calibration procedure, the technician will accurately describe the limited range/function and the statement, "T.O. directed" on the certification label.

12.6. The supervisor or designated (in writing) alternate of the branch that uses a laboratory-owned standard may authorize limited/special calibrations on that standard, and initial the 'User Approval' block of the certification label.

Section 13

SUBMITTING CHANGES

13.1. LOCAL PROCEDURES: This section contains local procedures and processes for submitting changes to calibration procedures, calibration intervals, technical orders, and any other documents affecting quality of work produced. Including local procedures for completing AFTO Forms 22 and AFTO Form 45.

13.2. TECHNICAL ORDER CHANGES: Changes to Air Force technical orders and publications will be made in accordance with T.O.'s 00-5-1, 00-5-2, and 00-20-14.

13.3. AFTO FORM 45: Equipment not listed in the CMS or 33K-1-100-2 will be requested for addition by submitting an AFTO Form 45 to AFMETCAL Det. 1/MLLW. This will be done in accordance with T.O. 00-20-14. The PMEL Planning Office and TMDE owner will jointly complete all AFTO Form 45's prior to scheduling any TMDE for calibration.

13.4. AFTO FORM 22: Any discrepancies noted in T.O.'s, being used by PMEL, will be corrected through the use of an AFTO Form 22. An AFTO Form 22 will be processed in accordance with T.O. 00-5-1.

13.5. LOCAL POLICIES: Changes to local policies, procedures or documentation will be submitted in writing to the PMEL Quality Manager. The submission should include the reason for change and a draft of the new policy, procedure, or documentation. The PMEL Quality Manager will evaluate submissions, and recommend approval, disapproval or modification. The recommendation will be forwarded to laboratory management with a final copy of the written policy, procedure or other documents, ready for signature.

13.5.1. The PMEL Manager will maintain a file containing all current policies along with any change requests and approvals. An electronic file of these current policies will be maintained on the PMEL Home Page to provide accessibility to all PMEL personnel.

Section 14

MEASUREMENT UNCERTAINTY

14.1. This section contains the PMEL's process for determining measurement uncertainty and calibration accuracy.

14.2. AFMETCAL PROGRAM: The AFMETCAL program differs from commercial industry in the application of uncertainties. Commercial laboratories publish uncertainties to inform their customer of the results of a specific measurement or set of measurements derived from an independent traceability chain. Conversely, the USAF rigidly controls the traceability chain. We determine the uncertainty required to operate our various weapons systems. We select standards to meet those uncertainties. We publish calibration procedures to ensure the transfer of the required accuracies. We provide specialized facilities and rigidly controlled environments. We formally train technicians to perform the calibrations. We provide a single interface with the National Institute of Standards and Technology through the Air Force Primary Standards Laboratory. Specification of measurement uncertainty is not necessary for Air Force applications when a laboratory complies with and applies the principles of the AFMETCAL program.

14.3. When available, the laboratory shall use AFMETCAL procedures, standards, and traceability chain.

14.4. UNCERTAINTY ANALYSIS: The laboratory shall consider the need to perform an uncertainty analysis in the following situations:

14.4.1. SUBSTITUTION OF STANDARDS: If there is a need to substitute TMDE standards required for calibration, T.O. 00-20-14, Para 3.1.5 will be strictly adhered to. Under no circumstances will equipment be substituted that does not meet the accuracy ratio specified in the original calibration procedure unless approved by an authorized AFMETCAL representative. A 4:1 ratio will be met at all times, or an analysis will be accomplished to determine what the accuracy will be and if a limitation of the TMDE is necessary. If so, section 12 of this manual will be followed regarding limitations.

14.4.2. ENVIRONMENT: If the laboratory environment does not meet requirements of T.O. 00-20-14 or the specific calibration Technical Order, calibration will cease until the environment is in tolerance. In all cases, requirements of T.O. 00-20-14, Para 8.2 through 8.3 will be met, as well as T.O. 33K-1-100-1, Para 3.1. (Gage Blocks).

14.4.3. TECHNICAL ORDERS: If an Air Force Calibration Technical Order is not published for the test instrument consult T.O. 00-20-14 section 3.1.2 to determine precedence.

14.4.4. ON SITE CALIBRATION: All onsite calibrations will be accomplished with consideration to the environmental effects. All TMDE will be operated within the manufactures / T.O.'s recommended operating temperature.

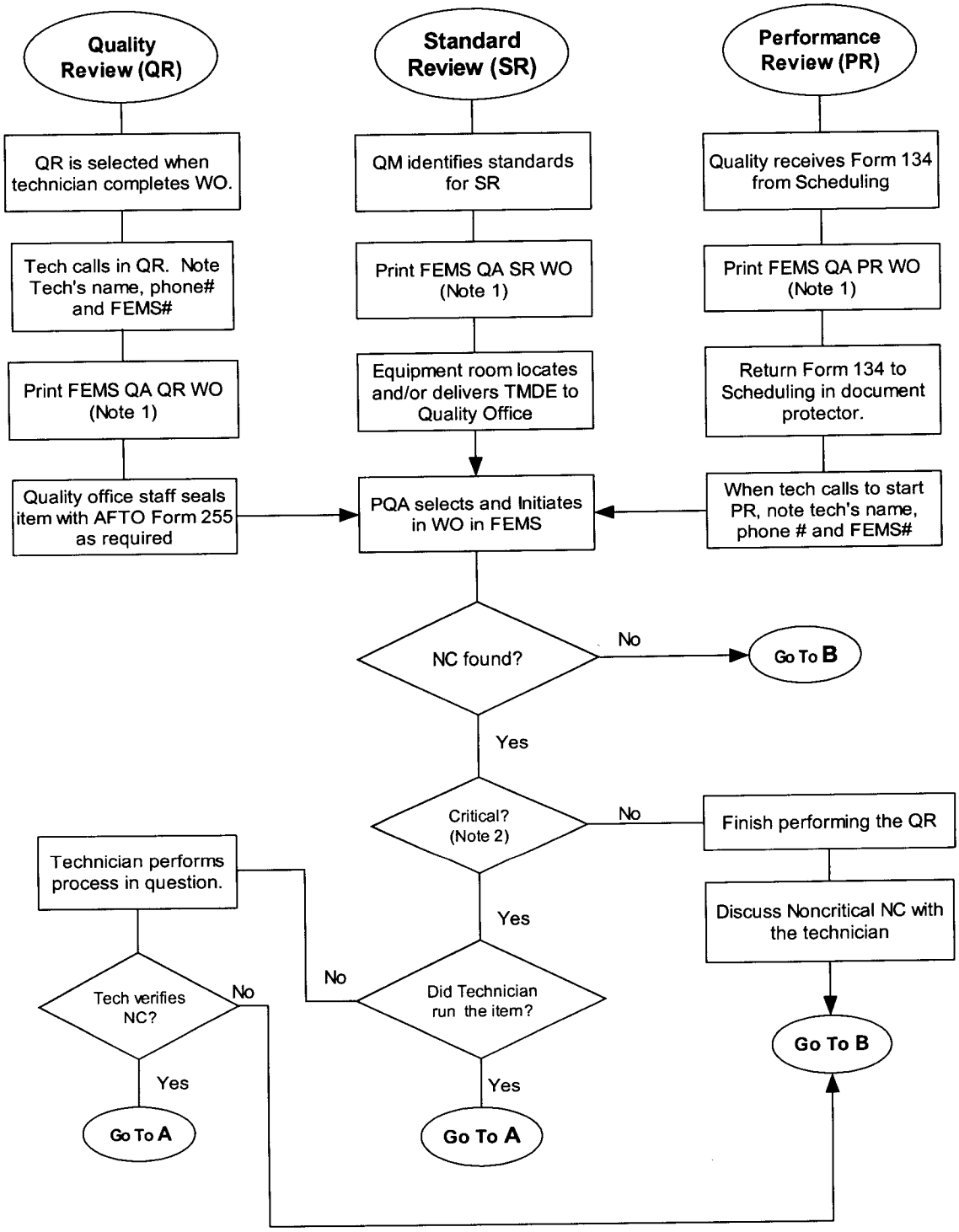
Appendix 1

CERTIFYING TECHNICIANS

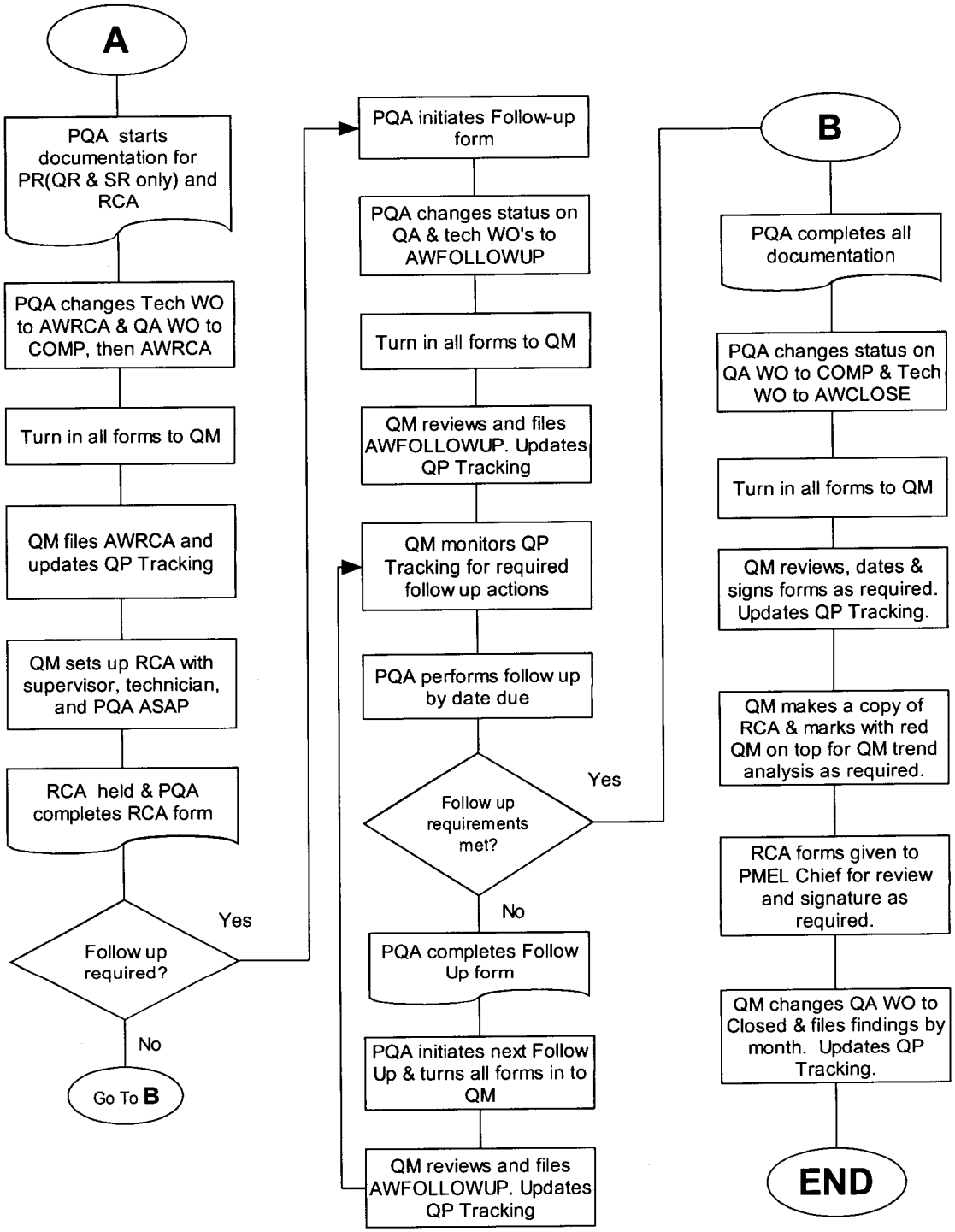
K-STAMP	Tech name	RCC	K-STAMP	Tech name	RCC

Appendix 2a

QUALITY PROGRAM (QP) FLOW CHART



Appendix 2b



Note 1: Go to FEMS Metrology Work Orders. Enter FEMS ID# in Equipment block. Select current QA Work Order. Select ACTIONS, CHANGE STATUS, APPROVE and proceed.
Select FILE, RUN REPORTS, TQPRPT, RUN (reports, PRINT, (1 copy), Enter QA WO#, OK

Note 2: If necessary, have second PQA verify critical non conformity.